National Climatic Data Center

DATA DOCUMENTATION

FOR

DATASET 6420l (DSI-6420l)

NOAA Research Flight Data (AOC)

DATASET WP-3D NOAA-42 Winter Ocean Winds 2006

July 6, 2006

National Climatic Data Center
151 Patton Avenue
Asheville, NC 28801-5001 USA

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1. Abstract

NOAA's Aircraft Operations Center (AOC) maintains and operates two WP-3D aircraft for weather research projects throughout the year. Examples of these projects are hurricanes, thunderstorms, atmospheric chemistry and winter weather missions. Each of these projects consists of a series of individual flights. For instance, during hurricane projects the WP-3D may fly a variety of missions through tropical cyclones.

The real-time flight-level data is collected and written to a digital data tape on the aircraft and afterwards converted to a file for faster processing and archiving. For each archived project, there are multiple directories consisting of individual flights. The data in these flight directories contain real-time measurements obtained from sensors located throughout the aircraft's interior and exterior. Also included in a flight directory are scanned images of the actual flight manifest, the navigation log and the mission observation log.

2. Element Names and Definitions

A data record contains 220 elements, stored as 16 bit integer words, and must undergo a conversion process to be displayed as engineering units (degrees, millibars, etc). All of the navigation data is stored as two16 bit integer words that can only be discerned through special bit shifting operations. If examination of the navigation data is desired, contact AOC for a copy of the bit shifting software.

The flight-level data file contains measurements at one-second intervals. These include time in UTC (Z), Global Positioning System (GPS) and inertial navigation data, altitudes, and a variety of temperature and pressure observations. Depending on the scientific objectives of a project, instrumentation will either be included or excluded from this list.

NOAA-42 Aircraft N42RF Winter Ocean Winds 2006

Array Location			Description
*			
1		Setup	MS Byte - Slow tape ID, LS Byte - Acft #
2		Setup	size of slow tape logical record == 220 words
3-8		Setup	Micro 99 time - yr,mo,da,hr,mn,sc; updated by fast
9-11		Fast	TBG 1 time - hr,min,sec; binary (not BCD)
12-14		Fast	TBG 2 time -same as TBG 1
15-17	GPS_Time	Fast	Collins GPS Time of fix - hr,min,sec; same as TBG's
18-19	GPS_Dat	Fast	Collins GPS Altitude - MS bit = -102400*32 ft
20-21		Fast	Collins GPS Latitude - MS bit = -PI*4 radians
22-23		Fast	Collins GPS Longitude - MS bit = -PI*4 radians
24-25		Fast	Collins GPS GPS North Vel. - MS bit = -1638.4*2 knots
26-27		Fast	Collins GPS GPS East Vel. - MS bit = -1638.4*2 knots
28-29		Fast	Collins GPS Vert. Vel. - MS bit = -2048*2 ft/sec
30		Fast	BR2G GPS Data Time; 0 to 3600, lsb = 1/100 sec
31		Fast	BR2G GPS Altitude; +/- 32767, lsb = 1 ft
32-33		Fast	BR2G GPS Latitude; msb = -PI*4 radians
34-35		Fast	BR2G GPS Longitude; msb = -PI*4 radians

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36              Fast       BR2G GPS Status and Horiz. Dilution of Precision
                                bits 15,14: 00 - no position, 01 -
uncorrected,
                                       10 - diff corrected, 11 - almanac used
                                bits 13-8: # of satellites used
                                ls byte - HDOP 00 to 99
37              Spare
38              Fast       Collins GPS North Accel. - MS bit = -128 m/s**2
39              Fast       Collins GPS East Accel. - MS bit = -128 m/s**s
40              Fast       Collins GPS Vert. Accel. - MS bit = -128 m/s**2
41              Fast       Collins GPS Chan 1 Status 1 \ See Rcvr 3M Spec. for
42              Fast       Collins GPS Chan 1 Status 2 /  bit assignments
43-50           Fast     Collins GPS Chan 2-5 Status - same format as Chan 1
51              Fast       Collins GPS Figure of Merit word - See Rcvr 3M
spec.
                              Note: Time FOM from word 64 is in reserved bits
                              (12,11,5,4 in HP notation; 3,4,10,11 in Collins
Notation)
52              Fast       Collins GPS expected horiz. error - LS bit = 1
meter
53              Fast       Collins GPS expected vert. error - LS bit = 1 meter
54                           Spare
55-56           Fast       INE 1 Altitude - MS bit = -102400*32 ft
57-58           Fast       INE 1 Latitude - MS bit = -PI*4 radians
59-60           Fast       INE 1 Longitude - MS bit = -PI*4 radians
61-62           Fast       INE 1 North Vel. - MS bit = -1638.4*2 knots
 63-64           Fast       INE 1 East Vel. - MS bit = -1638.4*2 knots
65-66           Fast       INE 1 Vert. Speed - MS bit = -2048*2 ft/sec
67-68           Fast       INE 1 Drift Angle - MS bit = -PI*4 radians
69-70           Fast       INE 1 Heading - MS bit = -PI*4 radians
71-72           Fast       INE 1 Pitch Angle - MS bit = -PI*4 radians
73-74           Fast       INE 1 Roll Angle - MS bit = -PI*4 radians
75-94           Fast       INE 2 Data - same as INE 1
95              Fast       APN-232 RA Data in meters; 1 sec avg
96              Fast       Spare; 1 sec avg
97              Fast       Spare; 1 sec avg
98              Fast       APN-159 RA synchro data in meters; 1 sec avg
99              Fast       APN-159 RA parallel encoder data in meters
100  INEflg     Fast       # of INE bursts avg'd this sec; ms byte - INE #1
                                ls byte - INE #2
101  GPSflg     Fast      GPS & APN232 RA burst count; ms-nyble - GPS
                                lat/lon/alt burst count, 2nd nyble- GPS
velocity
                                east/north/vert burst count, LS byte – APN232
RA
                               number of words averaged this second
102  GarFlg     Fast      # of ISEC word 96 & 97 samples avg'd this sec;
                                ms byte - ISEC(96), ls byte - ISEC(97)
103  Dig_Err    Fast      Error flags for Dig. Avg.; bit 0 for APN232, etc.
104              Spare
105  ADCstatus  ASSRV      ADC unit status - from ADC slow data burst
106  IAUstatus  Fast       IAU unit status - from IAU burst
107  OperSel    Slow       Operator selections: ms nybl - temp probe,
                                nybl 2 - nav. unit, nybl 3 - Alt. source
                                ls nybl - dewpoint unit
108              Fast       status from Wing Wiring Junction Box
109              Fast       status from Cloud Physics Station
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110            Fast       status from Flight Director Station
111            Fast       spare
112            Fast       event switch data - Nav,Sta1,Sta2,Sta3
113            Fast       event switch data - Nrack,Sta5,C3X,Sta7
114            Fast       event switch data - F/D,Pilot
115-116        Fast       Spare
117            Fast       Formvar count
118            Fast       Formvar speed
119            Fast       Vaisala Cabin Pres in mBar*20; LSB is update flag
120 128        Fast       Optional user serial data
129            Fast       SFMR Slot A Antenna Value (Counts)
130            Fast         "    "  " Warm Cal Load Value (Counts)
131            Fast         "    "  " Cold Cal Load Value (Counts)
132            Fast         "    "  " Spare
133 136        Fast       SFMR Slot B Values   same assignments as Slot A
137            Fast       SFMR Thermistor and Housekeeping Data   see below
138            Fast       SFMR Update Status word
                            Bit 0 2   Slot A Freq  | 000   Nothing in Slot
                                3 5   Slot B Freq  | 001   Freq #0 (4.74 GHz)
                                                   | 010   Freq #1 (5.31 GHz)

                                                   |  :
                                                   | 110   Freq #5 (7.09 GHz)
                                6 8   ISEC(137) data | 000   Nothing in loc
                                                   | 001   t0 (counts)
                                                   | 010   t1    "
                                                   | 011   t2    "
                                                   | 100   t3    "
                                                   | 101   t4    "
                                                   | 110   t5    "
                                                   | 111   Internal Press
                                                   |        (if MS bit=0)
                                                   |       or mode/status
                                                   |        (if MS bit=1)
139             Fast       M99 10 mSec tic when time was read - use for clock
                                drift tracking

140          J-W Liquid water
141          RMST TOTAL TEMP #1
142          RMST TOTAL TEMP #2
143          Dew Point 1 (DW1)  GENERAL EASTERN
144          AP Alpha (attack) Pressure
145          DAP Differential Alpha Pressure
146          BP Beta (slip) Pressure
147          DBP Differential Beta (slip) pressure
148          PSW Rosemount static pressure from wingtip(#1281)
149          PQW Rosemount dynamic pressure from wingtip(#1281)
150          RD  Radiometer Down measures SST (PRT-5)
151          Spare
152          RD Radiometer Side
153          Spare
154          Vertical Acceleration 2
155          Vertical Acceleration 1
156          RADOME ATTACK PRESSURE
157          RADOME SIDESLIP PRESSURE
158          RADOME DIFF. PRESSURE (RPQ)
159          RADOME IMPACT PRESSURE
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160	Total Temp #3 (fast response) Port side
161-163	Spare
164	DEWPOINT #2 (DW2) EDGETECH
165	Spare
166	Spare
167	Dewpoint #3 (DW3) EDGETECH
168-169	Spare
170	WVSII
171	King Liquid water
172	PSF - COPILOT ROSEMOUNT #1281 (FUSELAGE)
173	PQF1 - COPILOT ROSEMOUNT #1281 (FUSELAGE)
174	PQF2 - COPILOT ROSEMOUNT 1221F(FUSELAGE)
175-187	SPARE
188	AXBT1
189	AXBT2
190	AXBT3
191	Ozone TECO Carsey
192-219	Spare
220	Checksum for this second

3. Start Date

20060115

4. Stop Date

20060315

5. Coverage

a. Southernmost Latitude: 30N (or S)
b. Northernmost Latitude: 60N (or S)
c. Westernmost Longitude: -170 W (or E)
d. Easternmost Longitude: -120 W (or E)

6. How to Order Data

Ask NCDC's Climate Services about costs of obtaining this dataset.
Phone 828-271-4800
Fax 828-271-4876
e-mail: orders@ncdc.noaa.gov

7. Archiving Data Centers

Name : National Climatic Data Center/NCDC
Address: Federal Building
151 Patton Ave.
Asheville, NC 28801-5001
Voice Telephone: 828-271-4800

Name: Aircraft Operations Center
Address: Science and Engineering Division
P.O. Box 6829
MacDill AFB, FL 33608-0829
Voice Telephone: 813-828-3310
Fax: 813-828-5061

8. Technical Contact

Flight Director's Name: Martin Mayeaux
Address: Aircraft Operations Center
P.O. Box 6828
Macdill AFB, FL 33608-0829
Voice Telephone: 813-828-3310 x 3086
Fax: 813-828-5061

9. Known Uncorrected Problems

none

10. Quality Statement:

Disclaimer: This data is the raw flight-level weather data that has not been quality controlled for sensor contamination or other instrument related errors.

11. References:

Merceret, F.J., and Davis, H.W., 1981: The Determination of Navigational and Meteorological Variables Measured by NOAA/RFC WP3D Aircraft.